

# General Specifications

GS 01C27F01-01EN

EJX510B and EJX530B  
Absolute and Gauge Pressure  
Transmitter

**DP**harp **EJX**<sup>TM</sup>  
**ISA100**  
**Wireless**  
**COMPLIANT**

The high performance absolute and gauge pressure transmitters EJX510B and EJX530B feature single crystal silicon resonant sensor and are suitable to measure liquid, gas, or steam pressure. EJX510B and EJX530B transmit not only process variables but also the setting parameters using wireless signal. The transmitters run on internal batteries, and the installation cost can be decreased since hard-wiring is not required. The communication is compliant with ISA100.11a protocol specifications.



## FEATURES

### Long Life Battery Design

Ultra low current consumption design using two high capacity lithium-thionyl chloride batteries provide wireless operation for years.

### Security Assured Wireless Network Joining

Infrared communication between the devices for wireless network configuration and parameter setting.

### Quick Update Time

Selectable from 0.5 second to 60 minutes for measured process value to publish wirelessly.

## STANDARD SPECIFICATIONS

### WIRELESS SPECIFICATIONS

Communication protocol: ISA100.11a protocol  
Data rate: 250 kbps  
Frequency: 2400 - 2483.5 MHz license free ISM band  
Radio security: AES 128 bit codified  
RF Transmitter power: Max. 11.6 dBm (fixed)  
Antenna: +2 dBi Omni directional monopole type  
For amplifier housing code 8 and 9, separately sold remote antenna and antenna cables can be used.

### POWER SUPPLY SPECIFICATIONS

Battery:  
Use the dedicated battery pack.  
Rated voltage: 7.2 V  
Rated capacity: 19 Ah

### SPAN AND RANGE LIMITS

(For EJX510B, values are in absolute and lower range limits are 0.)

Measurement Span/Range	MPa	psi (/D1)	bar (/D3)	kgf/cm <sup>2</sup> (/D4)
A	Span	8 to 200 kPa	1.16 to 29	0.08 to 2
	Range	-100 to 200 kPa	-14.5 to 29	-1 to 2
B	Span	0.04 to 2	5.8 to 290	0.4 to 20
	Range	-0.1 to 2	-14.5 to 290	-1 to 20
C	Span	0.2 to 10	29 to 1450	2 to 100
	Range	-0.1 to 10	-14.5 to 1450	-1 to 100
D	Span	1 to 50	145 to 7200	10 to 500
	Range	-0.1 to 50	-14.5 to 7200	-1 to 500

T01E.ai

### PERFORMANCE SPECIFICATIONS

Zero - based calibrated span, linear output, wetted parts material code 'S' and silicone oil, in the continuous measurement mode unless otherwise mentioned.

#### Specification Conformance

EJX series ensures specification conformance to at least  $\pm 3\sigma$ .

#### Reference Accuracy of Calibrated Span

(includes the effects of terminal-based linearity, hysteresis, and repeatability)

Measurement span	A	B	C	D
Reference accuracy	$\pm 0.1\%$ of Span			
Span $\geq X$	$\pm(0.01+0.009 \text{ URL/Span})\%$ of Span			
Span $< X$	$\pm(0.01+0.009 \text{ URL/Span})\%$ of Span			
X	20 kPa (2.9 psi)	0.2 MPa (29 psi)	1 MPa (145 psi)	5 MPa (720 psi)
URL (Upper range limit)	200 kPa (29 psi)	2 MPa (290 psi)	10 MPa (1450 psi)	50 MPa (7200 psi)

T02E.ai

**Ambient Temperature Effects per 28°C (50°F) Change**

±(0.15% of Span + 0.15% of URL)

**Satability (All normal operating condition)**

±0.1% of URL per 1 year

**Vibration Effects**

Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field with general application or pipeline with low vibration level (10-60 Hz 0.15mm peak to peak displacement /60-500 Hz 2g)

**Mounting Position Effects**

Rotation in diaphragm plane has no effect. Tilting up to 90 degree will cause zero shift up to 0.21 kPa (0.84 inH<sub>2</sub>O) which can be corrected by the zero adjustment.

**Battery Pack**

Battery pack with long life lithium-thionyl chloride batteries. With the intrinsically safe type, the battery pack is replaceable in hazardous area. Typical battery life is 10 years at 60 seconds update time or 4 years at 10 seconds update time in the following conditions.\*

- Ambient temperature: 23±2°C
- Device role: IO mode
- LCD display: off

\* Environmental condition such as vibration may affect the battery life.

**Response Time (All capsules)**

150 ms

Including dead time of 100 ms (nominal)

**■ FUNCTIONAL SPECIFICATIONS****Output**

Wireless (ISA100.11a protocol) 2.4 GHz signal.

**Update Time**

Measurement mode	Pressure
Continuous	100 ms
Intermittent	0.5 to 3600 s selectable

If the update time is set at one second, the transmitter shifts to the continuous mode.

**Zero Adjustment Limits**

Zero can be fully elevated or suppressed, within the lower and upper range limits of the capsule.

**External Zero Adjustment**

External zero is continuously adjustable with 0.01% incremental resolution of span. Re-range can be done locally using the digital indicator with range-setting switch.

**Integral Indicator (LCD display)**

5-digit numerical display, 6-digit unit display and bar graph.

The indicator is configurable to display one or up to two of the following variables periodically;

Pressure and temperature.

See also "Factory Setting."

**Burst Pressure**

A, B and C capsule: 30 MPa

D capsule: 132 MPa

**Self Diagnostics**

Capsule failure, amplifier failure, configuration error, battery alarm, wireless communication alarm and over-range error for process variables.

**Software Download Function**

Software download function permits to update wireless field device software via ISA100.11a wireless communication.

**Power Supply**

2x primary lithium-thionyl chloride batteries

With battery case (batteries sold separately)

**■ NORMAL OPERATING CONDITION**

(Optional features or approval codes may affect limits.)

**Ambient Temperature Limits**

-40 to 85°C (-40 to 185°F)

-30 to 80°C (-22 to 176°F) LCD visible range

**Process Temperature Limits**

-40 to 120°C (-40 to 248°F)

**Ambient Humidity Limits**

0 to 100% RH

**Maximum Over Pressure**

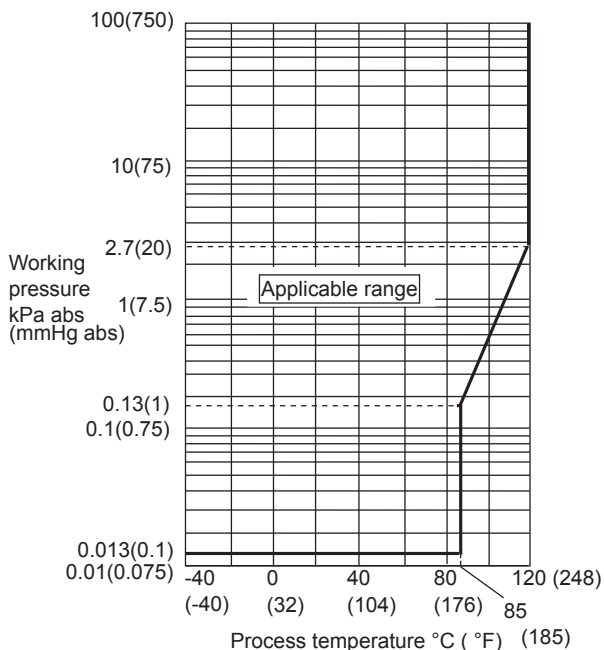
Pressure		
Capsule	EJX510B	EJX530B
A and B	4 MPa abs (580 psia)	4 MPa (580 psig)
C	20 MPa abs (2900 psia)	20 MPa (2900 psig)
D	75 MPa abs (10800 psia)	75 MPa (10800 psig)

**Working Pressure Limits (Silicone oil)****Maximum Pressure Limits**

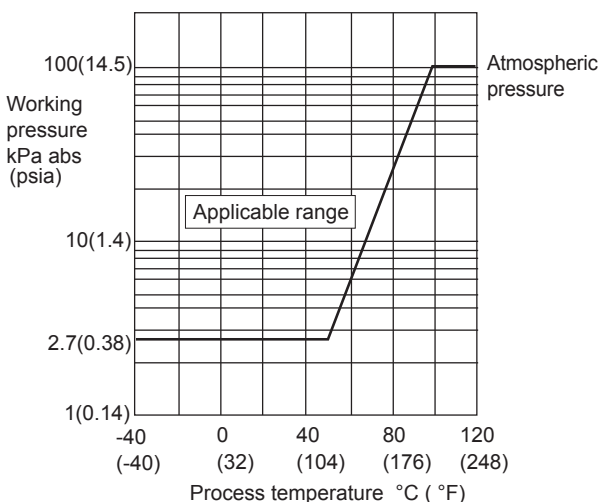
Pressure		
Capsule	EJX510B	EJX530B
A	200 kPa abs (29 psia)	200 kPa (29 psig)
B	2 MPa abs (290 psia)	2 MPa (290 psig)
C	10 MPa abs (1450 psia)	10 MPa (1450 psig)
D	50 MPa abs (7200 psia)	50 MPa (7200 psig)

**Minimum Pressure Limit**

See graph below



F01E.ai

**Figure 1-1. Working Pressure and Process Temperature  
[For EJX510B]**

F02E.ai

**Figure 1-2. Working Pressure and Process Temperature  
[For EJX530B]****■ REGULATORY COMPLIANCE STATEMENTS**

This device contains the wireless module.  
The wireless module satisfies the following standards.

\* Please confirm that an installation region fulfills a standards, require additional regulatory information and approvals, contact to Yokogawa Electric Corporation.

**EMC Conformity Standards**

EN61326-1 Class A, Table 2 (For use in industrial locations), EN61326-2-3

**R&TTE Conformity Standards C**

ETSI EN 300 328, ETSI EN 301 489-17, EN61010-1, EN62311

• Indoor/Outdoor use

AT	BE	BG	CY	CZ	DK
EE	FI	FR	DE	GR	HU
IE	IT	LV	LT	LU	MT
NL	PL	PT	RO	SK	SI
ES	SE	GB	IS	LI	NO
CH					

**European Pressure Equipment Directive 97/23/EC**

Sound Engineering Practice (for all capsules)

With option code /PE3 (for D capsule)

CE<sub>0038</sub>

Category III, Module H, Type of Equipment: Pressure Accessory-Vessel, Type of Fluid: Liquid and Gas, Group of Fluid: 1 and 2

**Regulation Conformity of the Wireless Module**

- FCC Approval
- IC Approval

## ■ PHYSICAL SPECIFICATIONS

### Wetted Parts Material

#### Diaphragm, Process Connector

Refer to "MODEL AND SUFFIX CODE."

### Non-wetted Parts Materials

#### Housing

Low copper cast aluminum alloy with polyurethane, mint-green paint (Munsell 5.6BG 3.3/2.9 or its equivalent)

#### Degrees of Protection

IP66/IP67, NEMA4X

#### Pipe

Polypropylene

#### Cover O-rings

Buna-N

#### Name plate and tag

304 SST tag plate wired onto transmitter

#### Fill Fluid

Silicone, fluorinated oil (optional)

### Weight

Capsule A, B and C: 3.2 kg (7.1 lb)\*

Capsule D: 3.4 kg (7.4 lb)\*

\*: Without battery pack and mounting bracket.

### Connections

Refer to "MODEL AND SUFFIX CODE."

### < Related Instruments >

Field Wireless System: Refer to GS 01W01A01-01EN

Field Wireless Integrated Gateway YFGW710:

Refer to GS 01W01F01-01EN

Field Wireless Management Station YFGW410:

GS 01W02D01-01EN

Field Wireless Access Point YFGW510:

GS 01W02E01-01EN

Field Wireless Media Converter YFGW610:

GS 01W02D02-01EN

### < Reference >

1. Hastelloy; Trademark of Haynes International Inc.

Other company names and product names used in this material are registered trademarks or trademarks of their respective owners.

## ■ MODEL AND SUFFIX CODES

Model	Suffix Codes	Description
<b>EJX510B</b> <b>EJX530B</b>	..... .....	Absolute pressure transmitter Gauge pressure transmitter
Output signal	<b>-L</b> .....	Wireless communication (ISA100.11a protocol)
Measurement span (capsule)	<b>A</b> ..... <b>B</b> ..... <b>C</b> ..... <b>D</b> .....	8 to 200 kPa (1.16 to 29 psi) 0.04 to 2 MPa (5.8 to 290 psi) 0.2 to 10 MPa (29 to 1450 psi) 1 to 50 MPa (145 to 7200 psi)
Wetted parts material *3	<b>S</b> ..... <b>H</b> .....	<u>Process connection</u> 316L SST # Hastelloy C-276 *1# <u>Diaphragm</u> Hastelloy C-276 *1# Hastelloy C-276 *1#
Process connections	<b>4</b> ..... <b>7</b> ..... <b>8</b> ..... <b>9</b> .....	1/2 NPT female 1/2 NPT male G1/2 male *2 M20×1.5 male *2
—	<b>N</b> .....	Always N
—	<b>-0</b> .....	Always 0
Amplifier housing	<b>7</b> ..... <b>8</b> ..... <b>9</b> .....	Cast aluminum alloy with integral antenna Cast aluminum alloy with detachable antenna (2 dBi)*5 Cast aluminum alloy without antenna (N connector)*4*5
Electrical connection	<b>J</b> .....	No electrical connection, battery-powered type (battery case only; battery cells not included)
Integral indicator	<b>D</b> .....	Digital indicator
Mounting bracket	<b>F</b> ..... <b>N</b> .....	304 SST 2-inch pipe mounting None
Optional codes		/□ Optional specification

The "►" marks indicates the most typical selection for each specification. Example: EJX530B-LAS4N-07JNN/□.

\*1: Hastelloy C-276 or ASTM N10276.

\*2: Not applicable for combination of capsule code **D** and wetted parts material code **H**. Threads are based on the withdrawn DIN 16 288.

\*3: Δ Users must consider the characteristics of selected wetted parts material and the influence of process fluids. The use of inappropriate materials can result in the leakage of corrosive process fluids and cause injury to personnel and/or damage to plant facilities. It is also possible that the diaphragm itself can be damaged and that material from the broken diaphragm and the fill fluid can contaminate the user's process fluids.  
Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide, sodium hypochlorite, and high-temperature steam (150°C [302°F] or above). Contact Yokogawa for detailed information of the wetted parts material.

\*4: Order the antenna separately from accessory option.

\*5: Remote antenna cables can be attached. Order separately from accessory option.

The '#' marks indicate the construction materials conform to NACE material recommendations per MR0175/ISO15156.

Please refer to the latest standards for details. Selected materials also conform to NACE MR0103.

## ■ OPTIONAL SPECIFICATIONS (For Explosion Protected type)

Item	Description	Code
Factory Mutual (FM)	FM Intrinsically safe Approval*1 Applicable Standard: FM3600, FM3610, FM3611, FM3810, ANSI/NEMA 250 Intrinsically Safe for Class I, Division 1, Groups A, B, C & D, Class II, Division 1, Groups E, F & G and Class III, Division 1, Class I, Zone 0, in Hazardous Locations, AEx ia IIC Nonincendive for Class I, Division 2, Groups A, B, C & D, Class II, Division 2, Groups F & G, and Class III, Division 1, Class I, Zone 2, Group IIC, in Hazardous Locations Enclosure: "NEMA 4X", Temp. Class: T4, Amb. Temp.: -50 to 70°C (-58 to 158°F)	FS17
ATEX	ATEX Intrinsically safe Approval Applicable Standard: EN60079-0, EN60079-11, EN60079-26 Certificate: KEMA 10ATEX0164 X II 1G Ex ia IIC T4 Ga Degree of protection: IP66/IP67 Maximum Process Temp.(Tp):120°C(248°F) Amb. Temp.(Tamb): -50 to 70°C (-58 to 158°F)	KS27
Canadian Standards Association (CSA)	CSA Intrinsically safe Approval*1 Certificate: 2325443 [For CSA C22.2] Applicable Standard: C22.2 No.0, C22.2 No.0.4, C22.2 No.25, C22.2 No.94, C22.2 No.157, C22.2 No.213, C22.2 No.61010-1 Intrinsically Safe for Class I, Division 1, Groups A, B, C & D, Class II, Division 1, Groups E, F & G, Class III, Division 1. Nonincendive for Class I, Division 2, Groups A, B, C & D, Class II, Division 2, Groups F & G, Class III, Division 1 Enclosure: Type 4X Temperature Code: T4 Ambient Temp.: -50 to 70°C (-58 to 158°F) [For CSA E60079] Applicable Standard: CAN/CSA E60079-0, CAN/CSA E60079-11, IEC60529 Ex ia IIC T4, Enclosure: IP66 and IP67 Maximum Process Temp.(Tp):120°C (248°F) Amb. Temp.(Tamb): -50 to 70°C (-58 to 158°F)	CS17
IECEX	IECEX Intrinsically safe Approval Applicable Standard: IEC60079-0:2011, IEC60079-11:2011, IEC60079-26:2006 Certificate: IECEX KEM 10.0074 X II 1G Ex ia IIC T4 Ga Enclosure: IP66/IP67 Maximum Process Temp.(Tp):120°C(248°F) Amb. Temp.(Tamb): -50 to 70°C (-58 to 158°F)	SS27

\*1: Applicable for amplifier housing code 7.

## ■ OPTIONAL SPECIFICATIONS

Item		Description	Code
Painting	Color change	Amplifier cover only	P□
	Coating change	Anti-corrosion coating *1	X2
Oil-prohibited use*10		Degrease cleansing treatment	K1
		Degrease cleansing treatment with fluorinated oilfilled capsule. Operating temperature -20 to 80°C ( -4 to 176°F)	K2
Capsule fill fluid		Fluorinated oil filled in capsule Operating temperature -20 to 80°C ( -4 to 176°F)	K3
Calibration units*2	P calibration (psi unit)	(See Table for Span and Range Limits.)	D1
	bar calibration (bar unit)		D3
	M calibration (kgf/cm <sup>2</sup> unit)		D4
Gold-plated diaphragm*10		Inside of isolating diaphragms (fill fluid side) are gold plated, effective for hydrogen permeation.	A1
European Pressure Equipment Directive *11		PED 97/23/EC Category III, Module H, Type of Equipment: Pressure Accessory-Vessel, Type of Fluid: Liquid and Gas, Group of Fluid: 1 and 2	PE3
Material certificate*3		Process Connector	M15
Pressure test/ Leak test certificate*9	Test Pressure: 200 kPa (29 psi) *4	Nitrogen(N <sub>2</sub> ) Gas or Water *8 Retention time: one minute	T05
	Test Pressure: 2 MPa (290 psi) *5		T06
	Test Pressure: 10 MPa (1450 psi) *6		T07
	Test Pressure: 50 MPa (7200 psi) *7		T08

\*1: Not applicable with color change option.

\*2: The unit of MWP (Max. working pressure) on the name plate of a housing is the same unit as specified by option codes **D1**, **D3**, and **D4**.

\*3: Material traceability certification, per EN 10204 3.1 B.

\*4: Applicable for capsule code **A**.

\*5: Applicable for capsule code **B**.

\*6: Applicable for capsule code **C**.

\*7: Applicable for capsule code **D**.

\*8: Pure nitrogen gas or pure water is used for oil-prohibited use (option codes **K1** and **K2**).

\*9: The unit on the certificate is always kPa/MPa regardless of selection of option code **D1**, **D3** and **D4**.

\*10: Applicable for wetted parts material code **S**.

\*11: Applicable for measurement span code **D**. If compliance with category III is needed, specify this option code.

## ■ OPTIONAL ACCESSORIES

Product	Part number	Specification
Battery pack assembly	F9915NQ	Battery case, Lithium-thionyl chloride batteries 2 pieces
Batteries*1	F9915NR	Lithium-thionyl chloride batteries, 2 pieces
Battery case	F9915NK	Battery case only
Remote antenna cable	F9915KU	3 m with mounting bracket
	F9915KV	13 m (3 m+10 m), with arrester and mounting bracket
Antenna	F9915KW	2 dBi standard antenna
	F9915KX	0 dBi antenna
	F9915KY	6 dBi high gain antenna*2

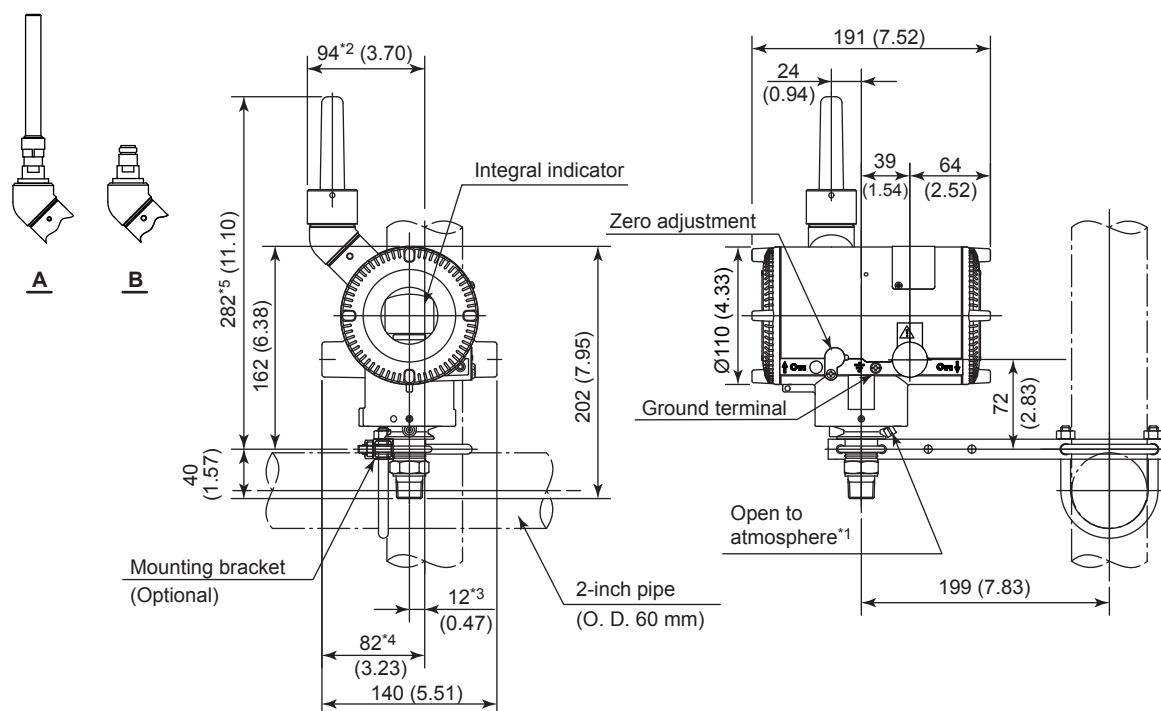
\*1: Alternatively, Tadiran SL-2780/S or TL-5930/S batteries can be purchased from your local distributor.

\*2: Use of high gain antenna is limited by local regulation of radio and telecommunication law. Consult Yokogawa for details.  
High gain antenna must be connected to the transmitter by using remote antenna cables.

## ■ DIMENSIONS

- Process connections code 7 (Amplifier housing code 7)

Unit: mm (approx. inch)



\*1: Applicable for EJX530B Measurement span code A, B, and C.

\*2: 92 mm (3.62 inch) for Measurement span code D. When amplifier housing code 8 or 9 is selected, subtract 1 mm (0.04 inch) from the value.

\*3: 11 mm (0.43 inch) for Measurement span code D.

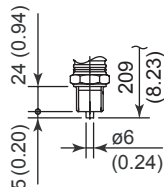
\*4: 80 mm (3.15 inch) for Measurement span code D.

\*5: When amplifier housing code 8 is selected, the value is 341 mm (13.43 inch). When amplifier housing code 9 is selected, the value is 221 mm (8.70 inch). In both cases, the figures are shown as A or B accordingly.

- Process connections code 4



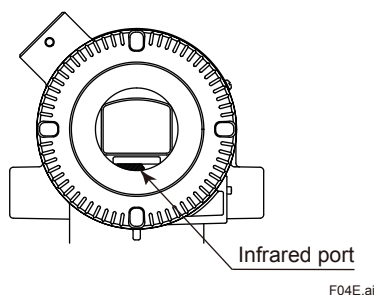
- Process connections code 8 and 9



F03E.ai



## • Infrared Configuration



### < Ordering Information >

Specify the following when ordering

1. Model, suffix codes, and option codes

2. Calibration range and units

1) Calibration range can be specified with range value specifications up to 5 digits for low or high range limits within the range of -32000 to 32000. When reverse range is designated, specify Lower Range Value (LRV) as greater than Upper Range Value (URV).

2) Specify only one unit from the table, 'Factory Settings' when shipped.'

3. Display scale and units

Specify either 0 to 100 % or engineering unit scale and 'Range and Unit' for engineering units scale: Scale range can be specified with range limit specifications up to 5 digits for low or high range limits within the range of -32000 to 32000. The unit display consists of 6-digit, therefore, if the specified unit is longer than 7 characters excluding '/', the first 6 characters will be displayed on the unit display.

4. Tag Number (if required)

Specify Tag number (up to 16 letters) to be engraved on the tag plate. The specified letters are written on TAG\_Name(16 letters) in the amplifier memory.

5. Software tag

Specify this software tag when tag number which is different from the tag number specified in the "TAG NUMBER" is required. The tag number specified in "SOFTWARE TAG" will be entered on "TAG" (up to 16 letters) in the amplifier memory.

### < Factory Setting >

Tag number	As specified in order
Calibration range lower range value	As specified in order
Calibration range upper range value	As specified in order
Calibration range units	[EJX530B] Selected from mmH <sub>2</sub> O, mmH <sub>2</sub> O (68°F), mmHg, Pa, kPa, MPa, mbar, bar, gf/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (68°F), inHg, ftH <sub>2</sub> O, ftH <sub>2</sub> O (68°F) or psi. (Only one unit can be specified) [EJX510B] Torr, Pa abs, kPa abs, MPa abs, mbar abs, bar abs, kgf/cm <sup>2</sup> abs, mmH <sub>2</sub> O abs, mmH <sub>2</sub> O abs (68°F), mmHg abs, inH <sub>2</sub> O abs, inH <sub>2</sub> O abs (68°F), inHg abs, ftH <sub>2</sub> O abs, ftH <sub>2</sub> O abs (68°F), psia, atm.
Display setting	Designated value specified in order. (% or user scaled value.)